

Thermal Guidelines For Data Processing Environments

Tensors for Data Processing Data Processing Handbook for Complex Biological Data Sources Concurrent Data Processing in Elixir Python for Data Analysis Practical Real-time Data Processing and Analytics Knowledge Graphs and Big Data Processing Introduction to Computers and Data Processing Data Processing and Reconciliation for Chemical Process Operations Computers and Data Processing Modern Big Data Processing with Hadoop Data Processing with Optimus Large Scale and Big Data Essentials of Geophysical Data Processing Knowledge Graphs and Big Data Processing Quantitative Data Processing in Scanning Probe Microscopy Data Processing on FPGAs Data Processing and Modeling with Hadoop Streaming Systems Earth Systems Data Processing and Visualization Using MATLAB Artificial Intelligence in Data and Big Data Processing Metabolomics Data Processing and Data Analysis-Current Best Practices NMR Data Processing Emerging Technologies and Applications in Data Processing and Management Perception-Based Data Processing in Acoustics Computing Standards Automatic Data Processing Handbook of Research on Intelligent Data Processing and Information Security Systems Automatic Data Processing: System/360 Edition Health Data Processing Big Data Processing Using Spark in Cloud Radar Data Processing With Applications Routine Data Processing in Earthquake Seismology Imaging Technologies and Data Processing for Food Engineers Data Processing Techniques and Applications for Cyber-Physical Systems (DPTA 2019) Computational Complexity and Feasibility of Data Processing and Interval Computations Optical Data Processing Big Data Processing with Apache Spark Acquisition and Processing of Marine Seismic Data Big Data Processing with Apache Spark

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Automatic Data Processing: System/360 Edition Jun 06 2020 Chapter 1 presents the necessary foundation and has been limited to topics essential to the remainder of the book, such as number systems, congruences, symbolic logic and encoding. Chapter 2-4 treat manual, semiautomatic (punched card), and automatic equipment, respectively. Chapter 4 treats the automatic computer in terms of a specific existing computer, the IBM 650 computer. The internal operation of computers, emphasizing organization rather than details, is treated in Chapter 5. Chapter 6 develops in some detail the vital and rarely treated topic of representation of data in computer storages and other topics in advanced programming. Chapter 7 develops the important topic of sorting, giving numerous explicit sorting algorithms and comparative evaluations. Chapter 8 treats the use of auxiliary computer programs in programming (automatic programming), program analysis (debugging), and manual control. Chapter 9 draws on its predecessors for a brief discussion of the art and technique of system design.

Modern Big Data Processing with Hadoop Dec 25 2021 A comprehensive guide to design, build and execute effective Big Data strategies using Hadoop Key Features -Get an in-depth view of the Apache Hadoop ecosystem and an overview of the architectural patterns pertaining to the popular Big Data platform -Conquer different data processing and analytics challenges using a multitude of tools such as Apache Spark, Elasticsearch, Tableau and more -A comprehensive, step-by-step guide that will teach you everything you need to know, to be an expert Hadoop Architect Book Description The complex structure of data these days requires sophisticated solutions for data transformation, to make the information more accessible to the users. This book empowers you to build such solutions with relative ease with the help of Apache Hadoop, along with a host of other Big Data tools. This book will give you a complete understanding of the data lifecycle management with Hadoop, followed by modeling of structured and unstructured data in Hadoop. It will also show you how to design real-time streaming pipelines by leveraging tools such as Apache Spark, and build efficient enterprise search solutions using Elasticsearch. You will learn to build enterprise-grade analytics solutions on Hadoop, and how to visualize your data using tools such as Apache Superset. This book also covers techniques for deploying your Big Data solutions on the cloud Apache Ambari, as well as expert techniques for managing and administering your Hadoop cluster. By the end of this book, you will have all the knowledge you need to build expert Big Data systems. What you will learn Build an efficient enterprise Big Data strategy centered around Apache Hadoop Gain a thorough understanding of using Hadoop with various Big Data frameworks such as Apache Spark, Elasticsearch and more Set up and deploy your Big Data environment on premises or on the cloud with Apache Ambari Design effective streaming data pipelines and build your own enterprise search solutions Utilize the historical data to build your analytics solutions and visualize them using popular tools such as Apache Superset Plan, set up and administer your Hadoop cluster efficiently Who this book is for This book is for Big Data professionals who want to fast-track their career in the Hadoop industry and become an expert Big Data architect. Project managers and mainframe professionals looking forward to build a career in Big Data Hadoop will also find this book to be useful. Some understanding of Hadoop is required to get the best out of this book.

Artificial Intelligence in Data and Big Data Processing Feb 12 2021 The book presents studies related to artificial intelligence (AI) and its applications to process and analyze data and big data to create machines or software that can better understand business behavior, industry activities, and human health. The studies were presented at "The 2021 International Conference on Artificial Intelligence and Big Data in Digital Era" (ICABDE 2021), which was held in Ho Chi Minh City, Vietnam, during December 18-19, 2021. The studies are pointing toward the famous slogan in technology "Make everything smarter," i.e., creating machines that can understand and can communicate with humans, and they must act like humans in different aspects such as vision, communication, thinking, feeling, and acting. "A computer would deserve to be called intelligent if it could deceive a human into believing that it was human" -Alan Turing

Knowledge Graphs and Big Data Processing Aug 21 2021 This open access book is part of the LAMDA Project (Learning, Applying, Multiplying Big Data Analytics), funded by the European Union, GA No. 809965. Data Analytics involves applying algorithmic processes to derive insights. Nowadays it is used in many industries to allow organizations and companies to make better decisions as well as to verify or disprove existing theories or models. The term data analytics is often used interchangeably with intelligence, statistics, reasoning, data mining, knowledge discovery, and others. The goal of this book is to introduce some of the definitions, methods, tools, frameworks, and solutions for big data processing, starting from the process of information extraction and knowledge representation, via knowledge processing and analytics to visualization, sense-making, and practical applications. Each chapter in this book addresses some pertinent aspect of the data processing chain, with a specific focus on understanding Enterprise Knowledge Graphs, Semantic Big Data Architectures, and Smart Data Analytics solutions. This book is addressed to graduate students from technical disciplines, to professional audiences following continuous education short courses, and to researchers from diverse areas following self-study courses. Basic skills in computer science, mathematics, and statistics are required.

Data Processing and Modeling with Hadoop May 18 2021 Understand data in a simple way using a data lake. KEY FEATURES - In-depth practical demonstration of Hadoop/Yarn concepts with numerous examples. - Includes graphical illustrations and visual explanations for Hadoop commands and parameters. - Includes details of dimensional modeling and Data Vault modeling. - Includes details of how to create and define a structure to a data lake. DESCRIPTION The book 'Data Processing and Modeling with Hadoop' explains how a distributed system works and its benefits in the big data era in a straightforward and clear manner. After reading the book, you will be able to plan and organize projects involving a massive amount of data. The book describes the standards and technologies that aid in data management and compares them to other technology business standards. The reader receives practical guidance on how to segregate and separate data into zones, as well as how to develop a model that can aid in data evolution. It discusses security and the measures that are utilized to reduce the impact of security. Self-service analytics, Data Lake, Data Vault 2.0, and Data Mesh are discussed in the book. After reading this book, the reader will have a thorough understanding of how to structure a data lake, as well as the ability to plan, organize, and carry out the implementation of a data-driven business with full governance and security. WHAT YOU WILL LEARN - Learn the basics of components of the Hadoop Ecosystem. - Understand the structure, files, and zones of a Data Lake. - Learn to implement the security part of the Hadoop Ecosystem. - Learn to work with the Data Vault 2.0 modeling. - Learn to develop a strategy to define good governance. - Learn new tools to work with Data and Big Data WHO THIS BOOK IS FOR This book caters to big data developers, technical specialists, consultants, and students who want to build good proficiency in big data. Knowing basic SQL concepts, modeling, and development would be good, although not mandatory. TABLE OF CONTENTS 1. Understanding the Current Moment 2. Defining the Zones 3. The Importance of Modeling 4. Massive Parallel Processing 5. Doing ETL/ELT 6. A Little Governance 7. Talking About Security 8. What Are the Next Steps?

Large Scale and Big Data Oct 23 2021 Large Scale and Big Data: Processing and Management provides readers with a central source of reference on the data management techniques currently available for large-scale data processing. Presenting chapters written by leading researchers, academics, and practitioners, it addresses the fundamental challenges associated with Big Data processing tools and techniques across a range of computing environments. The book begins by discussing the basic concepts and tools of large-scale Big Data processing and cloud computing. It also provides an overview of different programming models and cloud-based deployment models. The book's second section examines the usage of advanced Big Data processing techniques in different domains, including semantic web, graph processing, and stream processing. The third section discusses advanced topics of Big Data processing such as consistency management, privacy, and security. Supplying a comprehensive summary from both the research and applied perspectives, the book covers recent research discoveries and applications, making it an ideal reference for a wide range of audiences, including researchers and academics working on databases, data mining, and web scale data processing. After reading this book, you will gain a fundamental understanding of how to use Big Data-processing tools and techniques effectively across application domains. Coverage includes cloud data management architectures, big data analytics visualization, data management, analytics for vast amounts of unstructured data, clustering, classification, link analysis of big data, scalable data mining, and machine learning techniques.

Earth Systems Data Processing and Visualization Using MATLAB Mar 16 2021 This book is designed to provide easy means of problem solving based on the science philosophical and logical rules that lead to effective and reliable software at the service of professional earth system scientists through numerical scientific computation techniques. Through careful examination of software illuminated by brief scientific explanations given in the book the reader may develop his/her skills of computer program writing. Science aspects that are concerned with earth systems need numerical computation procedures and algorithms of data collected from the field measurements or laboratory records. The same is also valid for data processing in social sciences and economics. Some of the data assessment and processing procedures are at the large scales and complex, and therefore, require effective and efficient computer programs. Data reduction and graphical display in addition to probabilistic and statistical calculations are among the general purposes of the book. Not only students' works but also projects of researchers at universities and tasks of experts in different companies depend on reliable software. Especially, potential users of MATLAB in earth systems need a guidance book that covers a variety of practically applicable software solutions.

Big Data Processing with Apache Spark Jun 26 2019 Apache Spark is a popular open-source big-data processing framework that's built around speed, ease of use, and unified distributed computing architecture. Not only it supports developing applications in different languages like Java, Scala, Python, and R, it's also hundred times faster in memory and ten times faster even when running on disk compared to traditional data processing frameworks. Whether you are currently working on a big data project or interested in learning more about topics like machine learning, streaming data processing, and graph data analytics, this book is for you. You can learn about Apache Spark and develop Spark programs for various use cases in big data analytics using the code examples provided. This book covers all the libraries in Spark ecosystem: Spark Core, Spark SQL, Spark Streaming, Spark ML, and Spark GraphX.

Emerging Technologies and Applications in Data Processing and Management Nov 11 2020 Advances in web technology and the proliferation of sensors and mobile devices connected to the internet have resulted in the generation of immense data sets available on the web that need to be represented, saved, and exchanged. Massive data can be managed effectively and efficiently to support various problem-solving and decision-making techniques. Emerging Technologies and Applications in Data Processing and Management is a critical scholarly publication that examines the importance of data management strategies that coincide with advancements in web technologies.

Highlighting topics such as geospatial coverages, data analysis, and keyword query, this book is ideal for professionals, researchers, academicians, data analysts, web developers, and web engineers.

Computing Standards Sep 09 2020

Tensors for Data Processing Nov 04 2022 **Tensors for Data Processing: Theory, Methods and Applications** presents both classical and state-of-the-art methods on tensor computation for data processing, covering computation theories, processing methods, computing and engineering applications, with an emphasis on techniques for data processing. This reference is ideal for students, researchers and industry developers who want to understand and use tensor-based data processing theories and methods. As a higher-order generalization of a matrix, tensor-based processing can avoid multi-linear data structure loss that occurs in classical matrix-based data processing methods. This move from matrix to tensors is beneficial for many diverse application areas, including signal processing, computer science, acoustics, neuroscience, communication, medical engineering, seismology, psychometric, chemometrics, biometric, quantum physics and quantum chemistry. Provides a complete reference on classical and state-of-the-art tensor-based methods for data processing. Includes a wide range of applications from different disciplines. Gives guidance for their application.

Routine Data Processing in Earthquake Seismology Feb 01 2020 The purpose of this book is to get a practical understanding of the most common processing techniques in earthquake seismology. The book deals with manual methods and computer assisted methods. Each topic will be introduced with the basic theory followed by practical examples and exercises. There are manual exercises entirely based on the printed material of the book, as well as computer exercises based on public domain software. Most exercises are computer based. The software used, as well as all test data are available from <http://extras.springer.com>. This book is intended for everyone processing earthquake data, both in the observatory routine and in connection with research. Using the exercises, the book can also be used as a basis for university courses in earthquake processing. Since the main emphasis is on processing, the theory will only be dealt with to the extent needed to understand the processing steps, however references will be given to where more extensive explanations can be found. Includes: • Exercises • Test data • Public domain software (SEISAN) available from <http://extras.springer.com>

Data Processing Handbook for Complex Biological Data Sources Sep 02 2022 **Data Processing Handbook for Complex Biological Data** provides relevant and to the point content for those who need to understand the different types of biological data and the techniques to process and interpret them. The book includes feedback the editor received from students studying at both undergraduate and graduate levels, and from her peers. In order to succeed in data processing for biological data sources, it is necessary to master the type of data and general methods and tools for modern data processing. For instance, many labs follow the path of interdisciplinary studies and get their data validated by several methods. Researchers at those labs may not perform all the techniques themselves, but either in collaboration or through outsourcing, they make use of a range of them, because, in the absence of cross validation using different techniques, the chances for acceptance of an article for publication in high profile journals is weakened. Explains how to interpret enormous amounts of data generated using several experimental approaches in simple terms, thus relating biology and physics at the atomic level. Presents sample data files and explains the usage of equations and web servers cited in research articles to extract useful information from their own biological data. Discusses, in detail, raw data files, data processing strategies, and the web based sources relevant for data processing.

Acquisition and Processing of Marine Seismic Data Jul 28 2019 **Acquisition and Processing of Marine Seismic Data** demonstrates the main principles, required equipment, and suitable selection of parameters in 2D/3D marine seismic data acquisition, as well as theoretical principles of 2D marine seismic data processing and their practical implications. Featuring detailed datasets and examples, the book helps to relate theoretical background to real seismic data. This reference also contains important QC analysis methods and results both for data acquisition and marine seismic data processing. **Acquisition and Processing of Marine Seismic Data** is a valuable tool for researchers and students in geophysics, marine seismics, and seismic data, as well as for oil and gas exploration. Contains simple step-by-step diagrams of the methodology used in the processing of seismic data to demonstrate the theory behind the applications. Combines theory and practice, including extensive noise, QC, and velocity analyses, as well as examples for beginners in the seismic operations market. Includes simple illustrations to provide to the audience an easy understanding of the theoretical background. Contains enhanced field data examples and applications.

Knowledge Graphs and Big Data Processing Apr 28 2022 This open access book is part of the LAMBDA Project (Learning, Applying, Multiplying Big Data Analytics), funded by the European Union, GA No. 809965. Data Analytics involves applying algorithmic processes to derive insights. Nowadays it is used in many industries to allow organizations and companies to make better decisions as well as to verify or disprove existing theories or models. The term data analytics is often used interchangeably with intelligence, statistics, reasoning, data mining, knowledge discovery, and others. The goal of this book is to introduce some of the definitions, methods, tools, frameworks, and solutions for big data processing, starting from the process of information extraction and knowledge representation, via knowledge processing and analytics to visualization, sense-making, and practical applications. Each chapter in this book addresses some pertinent aspect of the data processing chain, with a specific focus on understanding Enterprise Knowledge Graphs, Semantic Big Data Architectures, and Smart Data Analytics solutions. This book is addressed to graduate students from technical disciplines, to professional audiences following continuous education short courses, and to researchers from diverse areas following self-study courses. Basic skills in computer science, mathematics, and statistics are required.

Health Data Processing May 06 2020 **Health Data Processing: Systemic Approaches** focuses on the design of health information systems and touches on the main themes of medical informatics and public health. The book is written for health professionals in practice or training, and is especially useful for decision-makers or future decision-makers in the field of health information systems. Users will find sections on the question of reusing data for other purposes, protection of individual liberties that this data and technologies make more acute, and the irruption of large masses of genetic data and its related problems. This book develops the methodological and conceptual aspects related to these issues. Proposes a methodology for the development of health information systems for the better use of digital technologies. Illustrates a systemic, transversal, conceptual vision that supports the complex reality of the healthcare world, where the interoperability of agents (professionals and software) is central. Discusses the reuse of resources of data for knowledge improvement, health security and public health.

Data Processing Oct 03 2022 **Data Processing: Made Simple, Second Edition** presents discussions of a number of trends and developments in the world of commercial data processing. The book covers the rapid growth of micro- and mini-computers for both home and office use; word processing and the 'automated office'; the advent of distributed data processing; and the continued growth of database-oriented systems. The text also discusses modern digital computers; fundamental computer concepts; information and data processing requirements of commercial organizations; and the historical perspective of the computer industry. The computer hardware and software and the development and implementation of a computer system are considered. The book tackles careers in data processing; the tasks carried out by the data processing department; and the way in which the data processing department fits in with the rest of the organization. The text concludes by examining some of the problems of running a data processing department, and by suggesting some possible solutions. Computer science students will find the book invaluable.

Essentials of Geophysical Data Processing Sep 21 2021 Concise, self-contained survey of data processing methods in geophysics and other sciences, for upper level science and engineering students.

Concurrent Data Processing in Elixir Aug 01 2022 Learn different ways of writing concurrent code in Elixir and increase your application's performance, without sacrificing scalability or fault-tolerance. Most projects benefit from running background tasks and processing data concurrently, but the world of OTP and various libraries can be challenging. Which Supervisor and what strategy to use? What about GenServer? Maybe you need back-pressure, but is GenStage, Flow, or Broadway a better choice? You will learn everything you need to know to answer these questions, start building highly concurrent applications in no time, and write code that's not only fast, but also resilient to errors and easy to scale. Whether you are building a high-frequency stock trading application or a consumer web app, you need to know how to leverage concurrency to build applications that are fast and efficient. Elixir and the OTP offer a range of powerful tools, and this guide will show you how to choose the best tool for each job, and use it effectively to quickly start building highly concurrent applications. Learn about Tasks, supervision trees, and the different types of Supervisors available to you. Understand why processes and process linking are the building blocks of concurrency in Elixir. Get comfortable with the OTP and use the GenServer behaviour to maintain process state for long-running jobs. Easily scale the number of running processes using the Registry. Handle large volumes of data and traffic spikes with GenStage, using back-pressure to your advantage. Create your first multi-stage data processing pipeline using producer, consumer, and producer-consumer stages. Process large collections with Flow, using MapReduce and more in parallel. Thanks to Broadway, you will see how easy it is to integrate with popular message broker systems, or even existing GenStage producers. Start building the high-performance and fault-tolerant applications Elixir is famous for today.

What You Need: You'll need Elixir 1.9+ and Erlang/OTP 22+ installed on a Mac OS X, Linux, or Windows machine.

Imaging Technologies and Data Processing for Food Engineers Jan 02 2020 Food products are complex in nature which makes their analysis difficult. Different scientific disciplines such as Biochemistry, microbiology, and nutrition, together with engineering concepts are involved in their characterization. However, imaging of food materials and data analysis has gained more importance due to innovations in the food industry, as well as the emergence of food nanotechnology. Image analysis protocols and techniques can be used in food structure analysis and process monitoring. Therefore, food structure imaging is crucial for various sections of the food chain starting from the raw material to the end product. This book provides information on imaging techniques such as electron microscopy, laser microscopy, x-ray tomography, raman and infrared imaging, together with data analysis protocols. It addresses the most recent advances in imaging technologies and data analysis of grains, liquid food systems (i.e. emulsions and gels), semi-solid and solid foams (i.e. bakery products, dough, expanded snacks), protein films, fruits and vegetable confectionery and nuts. This book also: Provides in-depth view of raw material characterization and process control. Covers structure-functionality and structure-texture relationships. Reviews applications to emerging areas of food science with an insight into future trends.

Data Processing with Optimus Nov 23 2021 Written by the core Optimus team, this comprehensive guide will help you to understand how Optimus improves the whole data processing landscape. Key Features Load, merge, and save small and big data efficiently with Optimus. Learn Optimus functions for data analytics, feature engineering, machine learning, cross-validation, and NLP. Discover how Optimus improves other data frame technologies and helps you speed up your data processing tasks. Book Description Optimus is a Python library that works as a unified API for data cleaning, processing, and merging data. It can be used for handling small and big data on your local laptop or on remote clusters using CPUs or GPUs. The book begins by covering the internals of Optimus and how it works in tandem with the existing technologies to serve your data processing needs. You'll then learn how to use Optimus for loading and saving data from text data formats such as CSV and JSON files, exploring binary files such as Excel, and for columnar data processing with Parquet, Avro, and OCR. Next, you'll get to grips with the profiler and its data types - a unique feature of Optimus Dataframe that assists with data quality. You'll see how to use the plots available in Optimus such as histogram, frequency charts, and scatter and box plots, and understand how Optimus lets you connect to libraries such as Plotly and Altair. You'll also delve into advanced applications such as feature engineering, machine learning, cross-validation, and natural language processing functions and explore the advancements in Optimus. Finally, you'll learn how to create data cleaning and transformation functions and add a hypothetical new data processing engine with Optimus. By the end of this book, you'll be able to improve your data science workflow with Optimus easily. What you will learn Use over 100 data processing functions over columns and other string-like values. Reshape and pivot data to get the output in the required format. Find out how to plot histograms, frequency charts, scatter plots, box plots, and more. Connect Optimus with popular Python visualization libraries such as Plotly and Altair. Apply string clustering techniques to normalize strings. Discover functions to explore, fix, and remove poor quality data. Use advanced techniques to remove outliers from your data. Add engines and custom functions to clean, process, and merge data. Who this book is for This book is for Python developers who want to explore, transform, and prepare big data for machine learning, analytics, and reporting using Optimus, a unified API to work with Pandas, Dask, cudf, Dask-cuDF, Vaex, and Spark. Although not necessary, beginner-level knowledge of Python will be helpful. Basic knowledge of the CLI is required to install Optimus and its requirements. For using GPU technologies, you'll need an NVIDIA graphics card compatible with NVIDIA's RAPIDS library, which is compatible with Windows 10 and Linux.

Data Processing Techniques and Applications for Cyber-Physical Systems (DPTA 2019) Dec 01 2019 This book covers cutting-edge and advanced research on data processing techniques and applications for Cyber-Physical Systems. Gathering the proceedings of the International Conference on Data Processing Techniques and Applications for Cyber-Physical Systems (DPTA 2019), held in Shanghai, China on November 15-16, 2019, it examines a wide range of topics, including: distributed processing for sensor data in CPS networks; approximate reasoning and pattern recognition for CPS networks; data platforms for efficient integration with CPS networks; and data security and privacy in CPS networks. Outlining promising future research directions, the book offers a valuable resource for students, researchers and professionals alike, while also providing a useful reference guide for newcomers to the field.

Radar Data Processing With Applications Mar 04 2020 **Radar Data Processing with Applications** Radar Data Processing with Applications He You, Xiu Jianjuan, Guan Xin, Naval Aeronautical and Astronautical University, China A summary of thirty years' worth of research, this book is a systematic introduction to the theory, development, and latest research results of radar data processing technology. Highlights of the book include sections on data pre-processing technology, track initiation, and data association. Readers are also introduced to maneuvering target tracking, multiple target tracking termination, and track management theory. In order to improve data analysis, the authors have also included group tracking registration algorithms and a performance evaluation of radar data processing. Presents both classical theory

and development methods of radar data processing Provides state-of-the-art research results, including data processing for modern radars and tracking performance evaluation theory Includes coverage of performance evaluation, registration algorithm for radar networks, data processing of passive radar, pulse Doppler radar, and phased array radar Features applications for those engaged in information engineering, radar engineering, electronic countermeasures, infrared techniques, sonar techniques, and military command Radar Data Processing with Applications is a handy guide for engineers and industry professionals specializing in the development of radar equipment and data processing. It is also intended as a reference text for electrical engineering graduate students and researchers specializing in signal processing and radars.

Automatic Data Processing Aug 09 2020

Big Data Processing Using Spark in Cloud Apr 04 2020 The book describes the emergence of big data technologies and the role of Spark in the entire big data stack. It compares Spark and Hadoop and identifies the shortcomings of Hadoop that have been overcome by Spark. The book mainly focuses on the in-depth architecture of Spark and our understanding of Spark RDDs and how RDD complements big data's immutable nature, and solves it with lazy evaluation, cacheable and type inference. It also addresses advanced topics in Spark, starting with the basics of Scala and the core Spark framework, and exploring Spark data frames, machine learning using Mllib, graph analytics using Graph X and real-time processing with Apache Kafka, AWS Kinesis, and Azure Event Hub. It then goes on to investigate Spark using PySpark and R. Focusing on the current big data stack, the book examines the interaction with current big data tools, with Spark being the core processing layer for all types of data. The book is intended for data engineers and scientists working on massive datasets and big data technologies in the cloud. In addition to industry professionals, it is helpful for aspiring data processing professionals and students working in big data processing and cloud computing environments.

Data Processing on FPGAs Jun 18 2021 Roughly a decade ago, power consumption and heat dissipation concerns forced the semiconductor industry to radically change its course, shifting from sequential to parallel computing. Unfortunately, improving performance of applications has now become much more difficult than in the good old days of frequency scaling. This is also affecting databases and data processing applications in general, and has led to the popularity of so-called data appliances-specialized data processing engines, where software and hardware are sold together in a closed box. Field-programmable gate arrays (FPGAs) increasingly play an important role in such systems. FPGAs are attractive because the performance gains of specialized hardware can be significant, while power consumption is much less than that of commodity processors. On the other hand, FPGAs are way more flexible than hard-wired circuits (ASICs) and can be integrated into complex systems in many different ways, e.g., directly in the network for a high-frequency trading application. This book gives an introduction to FPGA technology targeted at a database audience. In the first few chapters, we explain in detail the inner workings of FPGAs. Then we discuss techniques and design patterns that help mapping algorithms to FPGA hardware so that the inherent parallelism of these devices can be leveraged in an optimal way. Finally, the book will illustrate a number of concrete examples that exploit different advantages of FPGAs for data processing. Table of Contents: Preface / Introduction / A Primer in Hardware Design / FPGAs / FPGA Programming Models / Data Stream Processing / Accelerated DB Operators / Secure Data Processing / Conclusions / Bibliography / Authors' Biographies / Index

Introduction to Computers and Data Processing Mar 28 2022 Explains the workings of computer systems, describes the development of the electronic computer industry, and discusses the basics of computer programming

NMR Data Processing Dec 13 2020 NMR DATA PROCESSING Jeffrey C. Hoch and Alan S. Stern Nuclear Magnetic Resonance (NMR) spectroscopy is a powerful nondestructive technique for exploring the structure of matter. In recent years, NMR instrumentation has become increasingly sophisticated, and the software used to acquire and process NMR data continues to expand in scope and complexity. This software has always been difficult to understand, and, until now, it seemed likely to remain that way. NMR Data Processing examines and explains the techniques used to process, present, and analyze NMR data. It provides a complete account of the fundamentals of spectrum analysis and establishes a framework for applying those fundamentals to real NMR data. It also details, in clear and concise language, the basic principles underlying the complex software needed to analyze the data. Two chapters are devoted to the fundamentals and applications of discrete Fourier transform (DFT) in NMR, which was crucial to the development of modern NMR spectroscopy. A large part of the book focuses on increasingly important non-DFT methods, which obtain higher sensitivity and resolution. Other topics covered include: * Data formats * Processing for multidimensional experiments * Parametric modeling of NMR signals * Standard techniques-apodization, zero-filling, the Hilbert transform * Artifacts-aliasing, leakage, solvent signals * Advanced processing techniques-LP, MaxEnt, Bayesian analysis Jeffrey C. Hoch and Alan S. Stern conclude their in-depth look at this rapidly growing field by exploring methods for analyzing processed data, including visualization, quantification, and error analysis. Readers are provided with a solid foundation for developing new methods of their own. NMR Data Processing is an important tool for students learning basic principles for the first time, technicians troubleshooting data processing problems, and nonmagnetic researchers developing new techniques. It will help all NMR users acquire a true grasp of the methods behind the process, avoid the pitfalls of misapplication and misinterpretation, and exploit the full power of NMR software.

Metabolomics Data Processing and Data Analysis-Current Best Practices Jan 14 2021 Metabolomics data analysis strategies are central to transforming raw metabolomics data files into meaningful biochemical interpretations that answer biological questions or generate novel hypotheses. This book contains a variety of papers from a Special Issue around the theme "Best Practices in Metabolomics Data Analysis". Reviews and strategies for the whole metabolomics pipeline are included, whereas key areas such as metabolite annotation and identification, compound and spectral databases and repositories, and statistical analysis are highlighted in various papers. Altogether, this book contains valuable information for researchers just starting in their metabolomics career as well as those that are more experienced and look for additional knowledge and best practice to complement key parts of their metabolomics workflows.

Computers and Data Processing Jan 26 2022 Computers and Data Processing provides information pertinent to the advances in the computer field. This book covers a variety of topics, including the computer hardware, computer programs or software, and computer applications systems. Organized into five parts encompassing 19 chapters, this book begins with an overview of some of the fundamental computing concepts. This text then explores the evolution of modern computing systems from the earliest mechanical calculating devices to microchips. Other chapters consider how computers present their results and explain the storage and retrieval of massive amounts of computer-accessible information from secondary storage devices. This book discusses as well the development installation, evaluation, and control of computer systems. The final chapter discusses the use of computers in the transportation systems and the ways in which they make possible other innovations in transportation. This book is a valuable resource for computer scientists, systems analysts, computer programmers, mathematicians, and computer specialists.

Perception-Based Data Processing in Acoustics Oct 11 2020 This monograph provides novel insights into cognitive mechanisms underlying the processing of sound and music in different environments. A solid understanding of these mechanisms is vital for numerous technological applications such as for example information retrieval from distributed musical databases or building expert systems. In order to investigate the cognitive mechanisms of music perception fundamentals of hearing psychophysiology and principles of music perception are presented. In addition, some computational intelligence methods are reviewed, such as rough sets, fuzzy logic, artificial neural networks, decision trees and genetic algorithms. The applications of hybrid decision systems to problem solving in music and acoustics are exemplified and discussed on the basis of obtained experimental results.

Practical Real-time Data Processing and Analytics May 30 2022 A practical guide to help you tackle different real-time data processing and analytics problems using the best tools for each scenario About This Book Learn about the various challenges in real-time data processing and use the right tools to overcome them This book covers popular tools and frameworks such as Spark, Flink, and Apache Storm to solve all your distributed processing problems A practical guide filled with examples, tips, and tricks to help you perform efficient Big Data processing in real-time Who This Book Is For If you are a Java developer who would like to be equipped with all the tools required to devise an end-to-end practical solution on real-time data streaming, then this book is for you. Basic knowledge of real-time processing would be helpful, and knowing the fundamentals of Maven, Shell, and Eclipse would be great. What You Will Learn Get an introduction to the established real-time stack Understand the key integration of all the components Get a thorough understanding of the basic building blocks for real-time solution designing Garnish the search and visualization aspects for your real-time solution Get conceptually and practically acquainted with real-time analytics Be well equipped to apply the knowledge and create your own solutions In Detail With the rise of Big Data, there is an increasing need to process large amounts of data continuously, with a shorter turnaround time. Real-time data processing involves continuous input, processing and output of data, with the condition that the time required for processing is as short as possible. This book covers the majority of the existing and evolving open source technology stack for real-time processing and analytics. You will get to know about all the real-time solution aspects, from the source to the presentation to persistence. Through this practical book, you'll be equipped with a clear understanding of how to solve challenges on your own. We'll cover topics such as how to set up components, basic executions, integrations, advanced use cases, alerts, and monitoring. You'll be exposed to the popular tools used in real-time processing today such as Apache Spark, Apache Flink, and Storm. Finally, you will put your knowledge to practical use by implementing all of the techniques in the form of a practical, real-world use case. By the end of this book, you will have a solid understanding of all the aspects of real-time data processing and analytics, and will know how to deploy the solutions in production environments in the best possible manner. Style and Approach In this practical guide to real-time analytics, each chapter begins with a basic high-level concept of the topic, followed by a practical, hands-on implementation of each concept, where you can see the working and execution of it. The book is written in a DIY style, with plenty of practical use cases, well-explained code examples, and relevant screenshots and diagrams.

Data Processing and Reconciliation for Chemical Process Operations Feb 24 2022 Computer techniques have made online measurements available at every sampling period in a chemical process. However, measurement errors are introduced that require suitable techniques for data reconciliation and improvements in accuracy. Reconciliation of process data and reliable monitoring are essential to decisions about possible system modifications (optimization and control procedures), analysis of equipment performance, design of the monitoring system itself, and general management planning. While the reconciliation of the process data has been studied for more than 20 years, there is no single source providing a unified approach to the area with instructions on implementation. Data Processing and Reconciliation for Chemical Process Operations is that source. Competitiveness on the world market as well as increasingly stringent environmental and product safety regulations have increased the need for the chemical industry to introduce such fast and low cost improvements in process operations. Introduces the first unified approach to this important field Bridges theory and practice through numerous worked examples and industrial case studies Provides a highly readable account of all aspects of data classification and reconciliation Presents the reader with material, problems, and directions for further study

Quantitative Data Processing in Scanning Probe Microscopy Jul 20 2021 Quantitative Data Processing in Scanning Probe Microscopy: SPM Applications for Nanometrology, Second Edition describes the recommended practices for measurements and data processing for various SPM techniques, also discussing associated numerical techniques and recommendations for further reading for particular physical quantities measurements. Each chapter has been revised and updated for this new edition to reflect the progress that has been made in SPM techniques in recent years. New features for this edition include more step-by-step examples, better sample data and more links to related documentation in open source software. Scanning Probe Microscopy (SPM) techniques have the potential to produce information on various local physical properties. Unfortunately, there is still a large gap between what is measured by commercial devices and what could be considered as a quantitative result. This book determines to educate and close that gap. Associated data sets can be downloaded from <http://gwyddion.net/gspm/> Features step-by-step guidance to aid readers in progressing from a general understanding of SPM principles to a greater mastery of complex data measurement techniques Includes a focus on metrology aspects of measurements, arming readers with a solid grasp of instrumentation and measuring methods accuracy Worked examples show quantitative data processing for different SPM analytical techniques

Computational Complexity and Feasibility of Data Processing and Interval Computations Oct 30 2019 Targeted audience * Specialists in numerical computations, especially in numerical optimization, who are interested in designing algorithms with automatic result verification, and who would therefore be interested in knowing how general their algorithms can in principle be. * Mathematicians and computer scientists who are interested in the theory of computing and computational complexity, especially computational complexity of numerical computations. * Students in applied mathematics and computer science who are interested in computational complexity of different numerical methods and in learning general techniques for estimating this computational complexity. The book is written with all explanations and definitions added, so that it can be used as a graduate level textbook. What this book is about Data processing. In many real-life situations, we are interested in the value of a physical quantity y that is difficult (or even impossible) to measure directly. For example, it is impossible to directly measure the amount of oil in an oil field or a distance to a star. Since we cannot measure such quantities directly, we measure them indirectly, by measuring some other quantities X_i and using the known relation between y and X_i 's to reconstruct y . The algorithm that transforms the results X_i of measuring X_i into an estimate f_j for y is called data processing.

Big Data Processing with Apache Spark Aug 28 2019 No need to spend hours ploughing through endless data - let Spark, one of the fastest big data processing engines available, do the hard work for you. Key Features Get up and running with Apache Spark and Python Integrate Spark with AWS for real-time analytics Apply processed data streams to machine learning APIs of Apache Spark Book Description Processing big data in real time is challenging due to scalability, information consistency, and fault-

tolerance. This book teaches you how to use Spark to make your overall analytical workflow faster and more efficient. You'll explore all core concepts and tools within the Spark ecosystem, such as Spark Streaming, the Spark Streaming API, machine learning extension, and structured streaming. You'll begin by learning data processing fundamentals using Resilient Distributed Datasets (RDDs), SQL, Datasets, and Dataframes APIs. After grasping these fundamentals, you'll move on to using Spark Streaming APIs to consume data in real time from TCP sockets, and integrate Amazon Web Services (AWS) for stream consumption. By the end of this book, you'll not only have understood how to use machine learning extensions and structured streams but you'll also be able to apply Spark in your own upcoming big data projects. What you will learn

Write your own Python programs that can interact with Spark
Implement data stream consumption using Apache Spark
Recognize common operations in Spark to process known data streams
Integrate Spark streaming with Amazon Web Services (AWS)
Create a collaborative filtering model with the movielens dataset
Apply processed data streams to Spark machine learning APIs
Who this book is for
Data Processing with Apache Spark is for you if you are a software engineer, architect, or IT professional who wants to explore distributed systems and big data analytics. Although you don't need any knowledge of Spark, prior experience of working with Python is recommended.

Streaming Systems Apr 16 2021 Streaming data is a big deal in big data these days. As more and more businesses seek to tame the massive unbounded data sets that pervade our world, streaming systems have finally reached a level of maturity sufficient for mainstream adoption. With this practical guide, data engineers, data scientists, and developers will learn how to work with streaming data in a conceptual and platform-agnostic way. Expanded from Tyler Akidau's popular blog posts "Streaming 101" and "Streaming 102", this book takes you from an introductory level to a nuanced understanding of the what, where, when, and how of processing real-time data streams. You'll also dive deep into watermarks and exactly-once processing with co-authors Slava Chernyak and Reuven Lax. You'll explore: How streaming and batch data processing patterns compare The core principles and concepts behind robust out-of-order data processing How watermarks track progress and completeness in infinite datasets How exactly-once data processing techniques ensure correctness How the concepts of streams and tables form the foundations of both batch and streaming data processing The practical motivations behind a powerful persistent state mechanism, driven by a real-world example How time-varying relations provide a link between stream processing and the world of SQL and relational algebra

Optical Data Processing Sep 29 2019 With contributions by numerous experts

Python for Data Analysis Jun 30 2022 Get complete instructions for manipulating, processing, cleaning, and crunching datasets in Python. Updated for Python 3.6, the second edition of this hands-on guide is packed with practical case studies that show you how to solve a broad set of data analysis problems effectively. You'll learn the latest versions of pandas, NumPy, IPython, and Jupyter in the process. Written by Wes McKinney, the creator of the Python pandas project, this book is a practical, modern introduction to data science tools in Python. It's ideal for analysts new to Python and for Python programmers new to data science and scientific computing. Data files and related material are available on GitHub. Use the IPython shell and Jupyter notebook for exploratory computing Learn basic and advanced features in NumPy (Numerical Python) Get started with data analysis tools in the pandas library Use flexible tools to load, clean, transform, merge, and reshape data Create informative visualizations with matplotlib Apply the pandas groupby facility to slice, dice, and summarize datasets Analyze and manipulate regular and irregular time series data Learn how to solve real-world data analysis problems with thorough, detailed examples

Handbook of Research on Intelligent Data Processing and Information Security Systems Jul 08 2020 Intelligent technologies have emerged as imperative tools in computer science and information security. However, advanced computing practices have preceded new methods of attacks on the storage and transmission of data. Developing approaches such as image processing and pattern recognition are susceptible to breaches in security. Modern protection methods for these innovative techniques require additional research. The Handbook of Research on Intelligent Data Processing and Information Security Systems provides emerging research exploring the theoretical and practical aspects of cyber protection and applications within computer science and telecommunications. Special attention is paid to data encryption, steganography, image processing, and recognition, and it targets professionals who want to improve their knowledge in order to increase strategic capabilities and organizational effectiveness. As such, this book is ideal for analysts, programmers, computer engineers, software engineers, mathematicians, data scientists, developers, IT specialists, academicians, researchers, and students within fields of information technology, information security, robotics, artificial intelligence, image processing, computer science, and telecommunications.

thermal-guidelines-for-data-processing-environments

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